

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

Product form : Substance
Substance name : Carbon Dioxide
Product Code : CO2
CAS No. : 124-38-9
Formula : CO₂
Synonyms : Anhydride carbonique / Carbonic acid anhydride / Carbon dioxide / Carbonic acid gas / Carbonic anhydride / Carbon oxide / Dry ice / Khladon 744 / Kohlendioxyd / Kohlensaure / R 744

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/preparation : Refrigerant
Propellant gas
Carbonation
Fire extinguishing agent

1.3. Details of the supplier of the safety data sheet

PCS Sales (USA), Inc.
1101 Skokie Blvd.
Suite 400
Northbrook, IL 60062
T 800-241-6908 / 847-849-4200

Suite 500
122 1st Avenue South
Saskatoon, Saskatchewan Canada S7K7G3
T 800-667-0403 (Canada) / 800-667-3930 (USA)

SDS@PotashCorp.com - www.PotashCorp.com

1.4. Emergency telephone number

Emergency number : 800-424-9300
CHEMTREC

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture****GHS-US classification**

Simple Asphy. H380
Compressed gas H280
Refrigerated liquefied gas H281

Full text of H-phrases: see section 16

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2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



GHS04

Signal word (GHS-US) :

Warning

Hazard statements (GHS-US) :

H280 - Contains gas under pressure; may explode if heated
H281 - Contains refrigerated gas; may cause cryogenic burns or injury
H380 - May displace oxygen and cause rapid suffocation

Precautionary statements (GHS-US) :

P282 - Wear cold insulating gloves, eye protection, protective clothing
P315 - Get immediate medical advice and attention
P336 - Thaw frosted parts with lukewarm water. Do not rub affected area
P403 - Store in a well-ventilated place
P410+P403 - Protect from sunlight. Store in a well-ventilated place

2.3. Other hazards

Hazardous to the aquatic environment

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name : Carbon Dioxide

CAS No. : 124-38-9

EC no : 204-696-9

Name	Product identifier	%	GHS-US classification
Carbon dioxide	(CAS No.) 124-38-9	97-99	Simple Asphy., H380 Compressed gas, H280

Full text of H-phrases: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing. If necessary administer pulmonary resuscitation or oxygen, and keep warm. Seek immediate medical advice.

First-aid measures after skin contact : If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

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- First-aid measures after eye contact : Immediately rinse with water for a prolonged period (at least 15 minutes) while holding the eyelids wide open. Do not rub. Seek medical attention immediately.
- First-aid measures after ingestion : Ingestion is an unlikely route of exposure for a gas. If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : Refrigerated liquefied gas. Contact with product may cause cold burns or frostbite. Gas can be toxic as a simple asphyxiant by displacing oxygen from the air.
- Symptoms/injuries after inhalation : Risk of suffocation due to oxygen deficiency in confined areas. May displace oxygen and cause rapid suffocation. In a confined space, displacement of air may cause the exposure limits to be exceeded before the oxygen level drops below 18%. Inhalation may affect the nervous system causing headache, possibly dizziness, nausea, weakness, loss of coordination and unconsciousness.
- Symptoms/injuries after skin contact : Refrigerated liquefied gas. Contact with product may cause cold burns or frostbite.
- Symptoms/injuries after eye contact : Refrigerated liquefied gas. Contact with product may cause cold burns or frostbite.
- Symptoms/injuries after ingestion : Ingestion is an unlikely route of exposure for a gas. Refrigerated liquefied gas. Contact with product may cause cold burns or frostbite.
- Chronic symptoms : Repeated or prolonged exposure may affect the blood and central nervous system. Prolonged inhalation at low levels may cause irregular heartbeat.

4.3. Indication of any immediate medical attention and special treatment needed

Symptoms may be delayed. Carefully monitor patients with severe or prolonged exposure for symptoms of neurological effects. If breathing is difficult, give oxygen.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Not flammable. Use extinguishing media appropriate for surrounding fire.
- Unsuitable extinguishing media : None known.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.
- Explosion hazard : Cylinders involved in a fire may explode even if the fire has been extinguished. Do not attempt to move the cylinders until they have been cold for one hour.
- Reactivity : Hazardous reactions will not occur under normal conditions.

5.3. Advice for firefighters

- Firefighting instructions : On heating, there is a risk of bursting due to internal pressure build-up. Cool down the containers exposed to heat with a water spray.

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Protection during firefighting : Wear full fire-fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA). Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Stop leak if safe to do so. Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

6.1.1. For non-emergency personnel

Protective equipment : Use recommended respiratory protection.

Emergency procedures : Evacuate unnecessary personnel. Ventilate area. Keep upwind.

6.1.2. For emergency responders

Protective equipment : If possible, stop flow of product. Use recommended respiratory protection.

Emergency procedures : Evacuate unnecessary personnel. Ventilate area. Keep upwind.

6.2. Environmental precautions

If spill could potentially enter any waterway, including intermittent dry creeks, contact the U.S. COAST GUARD NATIONAL RESPONSE CENTER at 800-424-8802. In case of accident or road spill notify CHEMTREC at 800-424-9300. In other countries call CHEMTREC at (International code) +1-703-527-3887.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Provide adequate ventilation. Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. Discard any product, residual, or other materials according to current applicable laws and regulations.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Employ good maintenance practices to prevent leaks. Use good process control measures to prevent releases. Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Always leak check cylinders when first collected, delivered or used using an approved leak detection fluid. If inspection shows cylinders in poor condition, contact immediately the supplier.

Storage conditions : Securely chain cylinders when in use and protect against physical damage.

Storage area : Store in dry, cool area. Store in a well-ventilated place. Protect from high temperatures.

7.3. Specific end use(s)

Refrigerant. Propellant gas. Carbonation. Fire extinguishing agent.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Carbon Dioxide (124-38-9)		
USA ACGIH	ACGIH TWA (ppm)	5000 ppm
USA ACGIH	ACGIH STEL (ppm)	30,000 ppm
USA OSHA	OSHA PEL (TWA) (mg/m ³)	9000 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	5000 ppm
USA NIOSH	IDLH	40,000 ppm
USA NIOSH	STEL	30,000 ppm
Alberta	TWA / STEL	5000 ppm (TWA), 30,000 ppm (STEL)
British Columbia	TWA / STEL	5000 ppm (TWA), 15,000 ppm (STEL)
Manitoba	TWA / STEL	5000 ppm (TWA), 30,000 ppm (STEL)
New Brunswick	TWA / STEL	5000 ppm (TWA), 30,000 ppm (STEL)
Newfoundland & Labrador	TWA / STEL	5000 ppm (TWA), 30,000 ppm (STEL)
Northwest Territories	TWA / STEL	5000 ppm (TWA), 15,000 ppm (STEL)
Nova Scotia	TWA / STEL	5000 ppm (TWA), 30,000 ppm (STEL)
Nunavut	TWA / STEL	5000 ppm (TWA), 15,000 ppm (STEL)
Ontario	TWA / STEL	5000 ppm (TWA), 30,000 ppm (STEL)
Prince Edward Island	TWA / STEL	5000 ppm (TWA), 30,000 ppm (STEL)
Quebec	TWAEV / STEV	5000 ppm (TWA), 30,000 ppm (STEL)
Saskatchewan	TWA / STEL	5000 ppm (TWA), 30,000 ppm (STEL)
Yukon	TWA / STEL	5000 ppm (TWA), 15,000 ppm (STEL)

8.2. Exposure controls

- Appropriate engineering controls : Provide sufficient ventilation to keep carbon dioxide below the permissible exposure limit. Ensure adequate ventilation, especially in confined areas.
- Personal protective equipment : Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection.



- Hand protection : Check glove manufacturer's permeation / degradation information.
- Eye protection : Use chemical goggles or face shields to protect eyes from gas contact.
- Skin and body protection : Use protective clothing to protect from contact with gas or solid CO₂.
- Respiratory protection : If TLV is reached, wear NIOSH approved self contained breathing equipment or air line respirators.
- Environmental exposure controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Colorless gas at room temperature and pressure.
Molecular mass	: 44.01 g/mol
Colour	: Colorless.
Odour	: Odorless. Slightly acidic.
Odour threshold	: No data available
pH	: Slightly acidic. (In H ₂ O = 3.2 to 3.7 – CARBONIC ACID)
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: SUBLIMATION @ 1 ATM = -78.5 °C (-109.3 °F)
Freezing point	: -78.5 °C (-109.3 °F)
Boiling point	: Not a liquid at ambient pressure
Flash point	: No data available
Self ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
% Volatiles	: 100 % at 20 °C
Vapour pressure	: 5728.9 kPa at 20 °C
Relative vapour density at 20 °C	: 1.5 (Air = 1)
Density	: SOLID 1.524 g/cc at 0 °C (32 °F) and 1 ATM
Solubility	: Water: 1.45 g/l at 20 °C
Log Pow	: No data available
Log Kow	: No data available
Viscosity	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

Sublimation point	: -78.5 °C (-109.3 °F)
Gas group	: Refrigerated liquefied gas

SECTION 10: Stability and reactivity

10.1. Reactivity

Hazardous reactions will not occur under normal conditions.

10.2. Chemical stability

Stable under normal temperature and pressure.

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10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4. Conditions to avoid

Keep out of direct sunlight. Keep away from heat.

10.5. Incompatible materials

Avoid contact with : Potassium. Sodium. Alkaline earth metals.

10.6. Hazardous decomposition products

Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: Not classified
Skin corrosion/irritation	: Not classified pH: Slightly acidic
Serious eye damage/irritation	: Not classified pH: Slightly acidic
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity	EPA Ecological Toxicity rating :	If discharged in water, forms carbonic acid which varies in acidity from 3.2 – 3.7 protect against spills.
	Acute Toxicity to Fish:	No known toxicity
	Chronic Toxicity to Fish:	No known toxicity
	Acute Toxicity to Aquatic Invertebrates:	No known toxicity
	Chronic Toxicity to Aquatic Invertebrates:	No known toxicity
	Toxicity to Aquatic Plants:	No known toxicity
	Toxicity to Bacteria:	No known toxicity
	Toxicity to Soil Dwelling Organisms:	No known toxicity
	Toxicity to Terrestrial Plants:	No known toxicity
Environmental Fate:	Stability in Water:	No known environmental fate
	Stability in Soil:	No known environmental fate
	Transport and Distribution:	No No No known environmental fate
Toxicity:	No known toxicity.	
Degradation Products:	Biodegradation:	No known degradation products.
	Photodegradation:	No known degradation products.

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Waste disposal recommendations : Ventilate area thoroughly. Dispose of waste material in accordance with all local, regional, national, and international regulations.
- Additional information : Empty gas cylinders should be returned to the supplier for proper recycling or disposal.

SECTION 14: Transport information

In accordance with DOT / TDG / ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number

UN-No.(DOT) : UN2187

14.2. UN proper shipping name

- DOT Proper Shipping Name : Carbon dioxide, refrigerated liquid
- Department of Transportation (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115
- Hazard Classes
- Hazard labels (DOT) : 2.2 - Non-flammable compressed gas



- DOT Special Provisions (49 CFR 172.102) : **T75** - When portable tank instruction T75 is referenced in Column (7) of the 172.101 Table, the applicable refrigerated liquefied gases are authorized to be transported in portable tanks in accordance with the requirements of 178.277 of this subchapter.
TP5 - For a portable tank used for the transport of flammable refrigerated liquefied gases or refrigerated liquefied oxygen, the maximum rate at which the portable tank may be filled must not exceed the liquid flow capacity of the primary pressure relief system rated at a pressure not exceeding 120 percent of the portable tank's design pressure. For portable tanks used for the transport of refrigerated liquefied helium and refrigerated liquefied atmospheric gas (except oxygen), the maximum rate at which the tank is filled must not exceed the liquid flow capacity of the pressure relief device rated at 130 percent of the portable tank's design pressure. Except for a portable tank containing refrigerated liquefied helium, a portable tank shall have an outage of at least two percent below the inlet of the pressure relief device or pressure control valve, under conditions of incipient opening, with the portable tank in a level attitude. No outage is required for helium.
- DOT Packaging Exceptions (49 CFR 173.xxx) : 306
- DOT Packaging Non Bulk (49 CFR 173.xxx) : 304
- DOT Packaging Bulk (49 CFR 173.xxx) : 314;315

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14.3. Additional information

Emergency Response Guide (ERG) Number : 120

Other information : No supplementary information available.

Overland transport

No additional information available

Transport by sea

DOT Vessel Stowage Location : **D** - Stowage category "D" means the material must be stowed "on deck only" on a cargo vessel or on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on a passenger vessel in which the limiting number of passengers is exceeded.

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 50 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 500 kg

IATA ERG Number : 2L

SECTION 15: Regulatory information

15.1. US Federal regulations

Carbon Dioxide (124-38-9)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Sudden release of pressure hazard
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

15.2. US State regulations

The following states have an OSH program approved by OSHA. If you are located in any of these states you may be under state jurisdiction rather than federal jurisdiction and your state may have more stringent requirements than OSHA. You should consult your state regulations to ensure compliance.

Alaska	Indiana	Minnesota	North Carolina	Utah
Arizona	Iowa	Nevada	Oregon	Vermont
California	Kentucky	New Mexico	Puerto Rico	*Virgin Islands
*Connecticut	Maryland	*New Jersey	South Carolina	Virginia
Hawaii	Michigan	*New York	Tennessee	Washington
*Illinois				Wyoming

*The state plans in these states apply only to public sector employers. In these states private sector employers are subject to USOL – OSHA jurisdiction. All other state plans apply to both public and private sector employers.

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Carbon dioxide (124-38-9)

U.S. - Hawaii - Occupational Exposure Limits - STELs
U.S. - Hawaii - Occupational Exposure Limits - TWAs
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Maine - Air Pollutants - Greenhouse Gases (GHG)
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Volatile Organic Compounds Exempt From Requirements
U.S. - Michigan - Occupational Exposure Limits - STELs
U.S. - Michigan - Occupational Exposure Limits - TWAs
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - STELs
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New York - Occupational Exposure Limits - TWAs
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Tennessee - Occupational Exposure Limits - STELs
U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - STELs
U.S. - Vermont - Permissible Exposure Limits - TWAs
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs

15.3. Canadian regulations

Carbon dioxide (124-38-9)

Listed on the Canadian DSL (Domestic Substances List) inventory.
Listed on the Canadian Ingredient Disclosure List – Disclosure at 1%

WHMIS Classification	Class A - Compressed Gas
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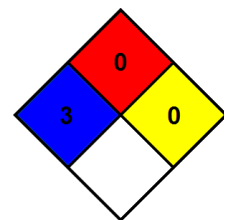
Carbon Dioxide (124-38-9)

WHMIS Classification	Uncontrolled product according to WHMIS classification criteria (solid)
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This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the the CPR.

SECTION 16: Other information

NFPA health hazard	: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
NFPA fire hazard	: 0 - Materials that will not burn.
NFPA reactivity	: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



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Full text of H-phrases:

Compressed gas	Gases under pressure Compressed gas
Refrigerated liquefied gas	Gases under pressure Refrigerated liquefied gas
Simple Asphy.	Simple Asphyxiant
H280	Contains gas under pressure; may explode if heated
H281	Contains refrigerated gas; may cause cryogenic burns or injury

Previous PotashCorp MSDS Number : MSDS 43 – Carbon Dioxide

Updated Section : Footer – SDS Reference Number

Logo Change : No other information changes; kept same date

SDS US (GHS HazCom 2012)

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